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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,051	12/06/2001	Stephen Mark Keating	450110-03718	7122

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EXAMINER

BHATNAGAR, ANAND P

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/006,051

**Applicant(s)**

KEATING ET AL.

**Examiner**

Anand Bhatnagar

**Art Unit**

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment***

1. Applicant's amendment filed on 02/22/05 has been entered and made of record.
2. Applicant has amended claims 1, 3, 12, 13, and 18. Currently claims 1-18 are pending.
3. Applicant in essence argues that the prior art of Manjunath et al. (U.S. patent 6,332,030) nor Cox et al. (U.S. patent 5,915,027) either alone or in combination fails to teach or suggest the "a scan direction that is the same direction in the sub-band as the direction of the low spatial frequencies of the image" as recited in the last two lines of claim 1. Claim 1, as well as claims 12 and 18, are constructed in an **alternative form** wherein either of two different processes can take place separately. Examiner has addressed/rejected both ways in these claims, while applicant's representative only argues that the prior art above does not teach some of the feature of the second method and is moot on examiner's rejection of first possible method. Since the claim construction calls for one of the two methods and both methods were rejected by the examiner then the examiner believes that these claims are still properly rejected and maintains the rejection to these claims. Examiner refers to the rejection below.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A.) Claims 1-7 and 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manjunath et al. (U.S. patent 6,332,030 B1).

Regarding claim 1: Manjunath et al. discloses an image processing apparatus operable to embed data into an image (fig. 6 and col. 1 lines 38-40), said apparatus comprising:

a combining processor operable to introduce said data into a transform domain representation providing a plurality of sub-bands divided by spatial frequency components (fig. 1, fig. 15 element 42, and col. 6 lines 35-38 and 52-56, wherein the encoder, read as the combining processor, embeds a watermark into the image that has been transformed into transform data, which is a plurality of sub-bands, by a DWT), and, in combination with a transform processor (fig. 1 and 15 wherein the DWT, is read as the transform processor, is combined with the encoder, which is read as the combining processor), to combine said data with said image (col. 6 lines 35-38 and 52-56), in one of

a transform domain form, said transform processor generating a transform domain form of said image (fig. 1, fig. 15, and col. 6 lines 50-56), said data being combined with said image by said combining processor in said transform domain

(fig. 1, fig. 15 element 42, and col. 6 lines 35-38 and 52-56, wherein the encoder, read as the combining processor, embeds a watermark into the image that has been transformed into transform data), and generating a spatial domain representation of said combined image and data (fig. 15 and col. 7 lines 5-24, wherein the combined image and data are inversely transformed into a watermarked image, this inverse transformation is read as "generating a spatial domain representation"), or a spatial domain form of said image, said transform processor generating a spatial domain representation of said transform domain data, said data being combined with said image by said combining processor in said spatial domain,

wherein said data is introduced into at least one of said sub-bands in a scan direction, said at least one sub-band representing in said transform domain low spatial frequencies of said image in one direction and high spatial frequencies of said image in another direction, said scan direction being in the same direction in the sub-band as the direction of the low spatial frequencies of the image (col. 6 lines 28-32, col. 7 lines 5-13, and col. 11 lines 4-12). Manjunath et al. discloses a system wherein an image is first decompose by a DWT, digital wavelet transform, followed by data embedding taking place in this decomposed image, then lastly the combined image being transformed back into spatial domain by inversely transforming the combined image by a IDWT, inverse digital wavelet transform, a different processor from the DWT. Manjunath does not teach that the same DWT, read as "transform processor," "generates a spatial

domain representation of said combined image and data." It is a matter of design choice, for one skilled in the art, to design the system to perform the transformations and/or embedding process by one processor or more than one processor.

Regarding claim 2: An image processing apparatus wherein said direction of said low spatial frequencies of said at least one sub-band and said another direction of said high spatial frequencies in said at least one sub-band are orthogonal with respect to each other (fig. 26 and col. 6 lines 34-43 and 52-56, wherein the frequencies are orthogonal to each other).

Regarding claim 3: An image processing apparatus comprising:

a modulator operable to modulate a Pseudo Random Symbol Stream each of the data symbols to be embedded, wherein said combining processor is operable to introduce said modulated Pseudo Random Symbol Stream in said scan direction into said transform domain representation.

Manjunath et al. discloses to embed data into an image. Manjunath does not teach to embed a Pseudo Random Symbol Stream into the transform domain of the image. This is a well known process, for one skilled in the art, in watermarking of using a pseudo random sequence in order to make the watermark more robust by making it less detectable in the image because it is randomly placed in the image. Examiner takes OFFICIAL NOTICE.

Regarding claim 4: An image processing apparatus wherein said transform is the discrete wavelet transform, said data symbols in each of said

sub-bands comprising wavelet coefficients each symbol of said modulated data being added to the wavelet coefficients (col. 6 lines 52-67 and col. 7 lines 1-24, wherein the scaled signature coefficients are embedded into the image coefficients).

Regarding claim 5: An image processing apparatus wherein said data is embedded in a first low vertical, high horizontal spatial frequencies sub-band, and a second high vertical, low horizontal spatial frequencies sub-band, said data being added to said first and second sub-bands in the vertical and the horizontal directions respectively (col. 6 lines 26-34 and col. 7 lines 1-13, wherein the low frequencies are embedded).

Regarding claim 6: An image processing apparatus wherein said data to be embedded in said image is distributed equally between said first and second sub-bands (col. 7 lines 5-13, wherein the signature coefficients are expanded to fit the host image bands. This is read as equally distributing between the bands).

Regarding claim 7: An image processing apparatus wherein said data to be embedded is a Universal Material Identifier (UMID) (col. 3 lines 25-29, wherein a signature is embedded into the image. A signature is a unique code/data and this is read as the "UMID").

Regarding claims 9 and 10: These claims are rejected as such they belong to the alternative form in claim 1 wherein the transform data is first transformed into spatial data before embedding.

Regarding claim 11: An image processing apparatus wherein said image is a video image (col. 1 lines 38-40).

Regarding claim 13: A signal representing an image in which data has been embedded by an image processing apparatus according to any Claim 1 (fig. 15 the watermarked image. This watermarked image is read as the signal wherein the data is embedded according to the process of claim 1).

Regarding claim 14: A computer program providing computer executable instructions, which when loaded on to a data processor configures said data processor to operate as an image processing apparatus as claimed in Claim 1 (Manjunath et al.; abstract and col. 3 lines 52-67, wherein digital data is embedded into a digital signal, i.e. performed by a computer and wherein there is a computer product on a computer medium with instructions carrying out the process).

Regarding claim 15: A computer program having computer executable instructions, which when loaded on to a data processor causes the data processor to perform the method according to Claim 12 (Manjunath et al.; abstract and col. 3 lines 52-67, wherein digital data is embedded into a digital signal, i.e. performed by a computer and wherein there is a computer product on a computer medium with instructions carrying out the process).

Regarding claim 16: A computer program product having a computer readable medium having recorded thereon information signals representative of the computer program claimed in Claim 14 (Manjunath et al.; abstract and col. 3



lines 52-67, wherein digital data is embedded into a digital signal, i.e. performed by a computer and wherein there is a computer product on a computer medium with instructions carrying out the process).

Regarding claim 17: A computer program product having a computer readable medium having recorded thereon information signals representative of the computer program claimed in Claim 15 (Manjunath et al.; abstract and col. 3 lines 52-67, wherein digital data is embedded into a digital signal, i.e. performed by a computer and wherein there is a computer product on a computer medium with instructions carrying out the process).

B.) Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Manjunath et al. (U.S. patent 6,332,030 B1) and Cox et al. (U.S. patent 5,915,027).

Regarding claim 8: An image processing apparatus comprising an error correction encoder operable to encode said data to form said data to be embedded.

Manjunath et al. discloses a system wherein a signature is embedded into a image. Manjunath et al. does not teach to use an error correction encoder to form the data for embedding. Cox et al. teaches to use an error correction encoder to form the data to embed (Cox. Et al.; fig. 2 element 20 and col. 5 lines 9-14, wherein the watermark is processed by the error correction encoder to process it for data embedding). It would have been obvious to one skilled in the

Art Unit: 2623

art to combine the teaching of Cox et al. to that of Manjunath et al. because they are analogous in watermarking. One in the art would have been motivated to incorporate the teaching of Cox et al. to the system of Manjunath et al. to achieve significant savings in computation (Cox et al.; col. 1 lines 13-15).

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

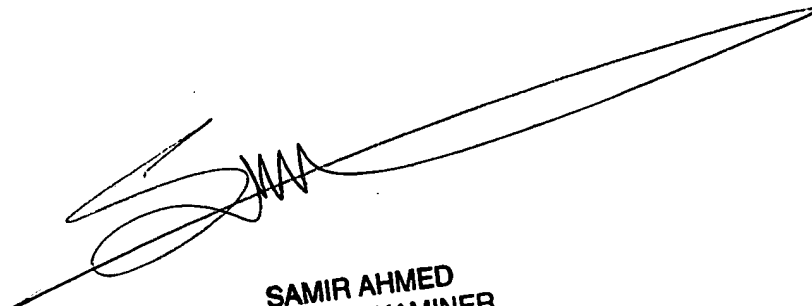
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### **Contact Information**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand Bhatnagar whose telephone number is

Art Unit: 2623

(571) 272-7416, whose acting supervisor is Jingge Wu whose number is (571) 272-7429, Central fax is 571-273-8300, and Tech center 2600 customer service office number is 703-306-0377.



**SAMIR AHMED  
PRIMARY EXAMINER**

AB

Anand Bhatnagar

Art Unit 2623

August 26, 2005